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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XE74

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Waterfront Improvement Projects

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; Issuance of an Incidental Harassment Authorization.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that NMFS has issued an incidental harassment authorization (IHA) to the U.S. Department of the Navy (Navy) to incidentally harass, by Level A and Level B harassment, marine mammals during construction activities associated with a waterfront improvement project at the Portsmouth Naval Shipyard (Shipyard) in Kittery, Maine.

DATES: This authorization is effective from January 1, 2017 through December 31, 2017.

FOR FURTHER INFORMATION CONTACT: Rob Pauline, Office of Protected Resources, NMFS, (301) 427-8401.

SUPPLEMENTARY INFORMATION:

Availability

An electronic copy of the Navy's application and supporting documents, as well as a list of the references cited in this document, may be obtained by visiting the Internet at: www.nmfs.noaa.gov/pr/permits/incidental/construction.htm. In case of problems accessing these documents, please call the contact listed above (see **FOR FURTHER INFORMATION CONTACT**).

Background

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce to allow, upon request by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified area, the incidental, but not intentional, taking of small numbers of marine mammals, providing that certain findings are made and the necessary prescriptions are established.

The incidental taking of small numbers of marine mammals may be allowed only if NMFS (through authority delegated by the Secretary) finds that the total taking by the specified activity during the specified time period will (i) have a negligible impact on the species or stock(s) and (ii) not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant). Further, the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such taking must be set forth.

Under section 101(a)(5)(D), NMFS after providing notice and opportunity for public comment may authorize such incidental taking by harassment only, for periods of not more than one year, pursuant to the mitigation, monitoring, and reporting requirements contained within an IHA. NMFS has defined "negligible impact" in 50 CFR 216.103 as ". . . an impact resulting from the specified activity that cannot be reasonably

expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.” Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines “harassment” as: “. . . any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).”

Summary of Request

On February 17, 2016, NMFS received an application from the Navy for the taking of marine mammals incidental to a waterfront improvement project. NMFS determined that the application was adequate and complete on April 1, 2016. The Navy is proposing to restore and modernize waterfront infrastructure associated with Dry Docks 1 and 3 at the Shipyard in Kittery, York County, Maine. The proposed action will include two waterfront improvement projects, structural repairs to Berths 11, 12, and 13, and replacement of the Dry Dock 3 caisson. The waterfront improvement projects will be constructed between October 2016 and October 2022, with in-water work expected to begin no earlier than January 2017. The requested IHA will be effective from January 1, 2017 through December 31, 2017. According to the project schedule work during the IHA period will only cover work occurring at Berth 11.

Use of vibratory and impact pile driving for pile installation and removal as well as drilling is expected to produce underwater sound at levels that have the potential to result in limited injury and behavioral harassment of marine mammals. The term “pile

driving” throughout this document includes vibratory driving, impact pile driving, vibratory pile extraction as well as pile drilling unless specified otherwise. Take, by Level B Harassment, may impact individuals of five species of marine mammals including harbor porpoise (*Phocoena phocoena*), gray seal (*Halichoerus grypus*), harbor seal (*Phoca vitulina*), hooded seal (*Cystophora cristata*) and harp seal (*Pagophilus groenlandicus*). As the next paragraph explains, we have determined, based on the best available information, that there may also be small numbers of take by Level A harassment of harbor porpoise, harbor seal, and gray seal.

In August 2016, NMFS released its Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Guidance). This new Guidance established new thresholds for predicting auditory injury, which equates to Level A harassment under the MMPA. In the August 4, 2016, *Federal Register* Notice (81 FR 51694), NMFS explained the approach it would take during a transition period, wherein we balance the need to consider this new best available science with the fact that some applicants have already committed time and resources to the development of analyses based on our previous thresholds and have constraints that preclude the recalculation of take estimates, as well as consideration of where the action is in the agency’s decision-making pipeline. In that Notice, we included a non-exhaustive list of factors that would inform the most appropriate approach for considering the new Guidance, including: the scope of effects; how far in the process the applicant has progressed; when the authorization is needed; the cost and complexity of the analysis; and the degree to which the Guidance is expected to affect our analysis.

In this case, the Navy initially submitted a request for authorization on February 17, 2016, which NMFS found adequate and complete on April 1, 2016. The Navy requires issuance of the authorization in order to ensure that this critical national security infrastructure project is able to meet its necessary start date. The Guidance indicates that there is a greater likelihood of auditory injury for phocid pinnipeds (*i.e.*, harbor seals, gray seals, hooded seals, and harp seals) and for high- frequency cetaceans (*i.e.*, harbor porpoise) than was considered in our notice of proposed authorization (81 FR 52614; August 9, 2016) because the Level A harassment zones are larger for impact driving. To account for the larger Level A zone that exists for harbor porpoises and the seal species, we authorize the taking by Level A harassment of 10 harbor porpoises, 4 harbor seals and 2 gray seals. Level A take for hooded and harp seals is not anticipated or authorized (since the likelihood of even Level B take for these species is small). We also increased the shutdown zones from 10 m to 75 m during impact driving and from 10 meter (m) to 55 m during vibratory driving. With these changes, the required mitigation measures, and a robust monitoring and mitigation program NMFS believes impacts to the affected species or stocks will be minimized.

In this analysis, we considered the potential for small numbers of harbor porpoises, harbor seals, and gray seals to incur auditory injury and found that it would not impact our determinations, including negligible impact determination. In summary, we have considered the new Guidance and believe that the likelihood of injury is adequately addressed in the analysis contained herein and appropriate mitigation measures are in place in the IHA.

Description of the Specified Activity

Overview

The Navy is proposing to restore and modernize infrastructure associated with Dry Docks 1 and 3 at the Shipyard in Kittery, York County, Maine (See Figure 1-1 in the Application). The proposed action will include two waterfront improvement projects, structural repairs to Berths 11, 12, and 13 and replacement of the Dry Dock 3 caisson.

The purpose of the proposed action is to modernize and maximize dry dock capabilities for performing current and future missions efficiently and with maximum flexibility. The need for the proposed action is to correct deficiencies associated with the pier structure at Berths 11, 12, and 13 and the Dry Dock 3 caisson and concrete seats to ensure that the Shipyard can continue to support its primary mission to service, maintain, and overhaul submarines. By supporting the Shipyard's mission, the proposed action will assist in meeting the larger need for the Navy to provide capabilities for training and equipping combat-capable naval forces ready to deploy worldwide. Proposed activities included as part of the waterfront improvement project with potential to affect marine mammals within the waterways adjacent to the Shipyard include vibratory and impact pile driving, vibratory extraction and pile drilling operations in the project area.

Dates and Duration

In-water construction associated with the proposed action will occur in phases over a six-year construction period. In-water construction is scheduled to begin in January 2017 and be completed by October 2022. This IHA is for the first year of in-water construction from January 1, 2017 to December 31, 2017. No seasonal limitations will be imposed on the construction timeline. This IHA covers all in-water construction

planned for Berth 11 structural repairs. The Navy intends to apply for sequential IHAs to cover each of the subsequent years of construction.

Table 1 below summarizes the in-water construction activities scheduled to take place during the timeframe covered by this IHA. Note that the proposed *Federal Register* notice (81 FR 52614) contained an error in Table 1. That *Federal Register* notice stated that the contractor would drill rock sockets, which could take about one day per socket. King piles would be regularly spaced along the berths and grouted into sockets drilled into the bedrock. The footnote in Table 1 indicated that ten king piles would be installed per day. However, only one socket and one king pile will actually be installed per day. Thus, the number of days of activities for the sockets to be drilled for the 94 king piles will be 94 days. Therefore, the total number of days of activity will increase from 72 to 156 and include the installation of 327 piles and removal of 141 piles. Note that impact driving, vibratory driving and drilling may occur on the same day. As such, 156 total days of pile-related activity can be considered a conservative projection. Table 1 below contains updated information.

Table 1. Revised Activity Summary for Year 1 of the Waterfront Improvement Projects

Activity/Method	Timing	Number of Days	Pile Type	Number of Piles Installed	Number of Piles Extracted
Berth 11(A, B, and C) Structural Repairs					
Extract timber piles/vibratory hammer	January 2017 to December 2017	10 ¹	15-inch timber pile	-	77
Install temporary sister piles for trestle system/vibratory hammer	January 2017 to December 2017	16 ²	14-inch steel H-type	64	-

Table 1. Revised Activity Summary for Year 1 of the Waterfront Improvement Projects

Activity/Method	Timing	Number of Days	Pile Type	Number of Piles Installed	Number of Piles Extracted
Install permanent king piles for bulkhead/auger drilling	January 2017 to December 2017	94	36-inch steel H-type piles	94	-
Install steel sheet-pile bulkhead/vibratory hammer (sheet piles and sheet pile returns)	January 2017 to December 2017	6	24-inch steel sheet-piles	112	-
Install permanent sister piles/impact hammer	January 2017 to December 2017	13 ²	14-inch steel H-type	50	-
Install timber dolphin/vibratory hammer	January 2017 to January 2017	1 ¹	15-inch timber piles	7	-
Extract temporary sister piles for trestle system/vibratory hammer	January 2017 to December 2017	16 ²	14-inch steel H-type	-	64
Totals		156		327	141

¹Estimate based on assumption of 30 minutes to drive each pile and 30-minute transition and set up time, resulting in one pile per hour and eight piles per day (ICF Jones and Strokes and Illingworth and Rodkin, Inc. 2012).

²Estimate based on assumption of a one-hour transition and set up time, resulting in one pile per two hours and four piles per day (ICF Jones and Strokes and Illingworth and Rodkin, Inc. 2012).

King Piles – estimate of 1 socket drilled per day

Sheet piles- estimate of 20 per day, based on 20 piles in 8 hours (*i.e.*, one day) because they will be installed two at a time

Specified Geographic Region

The Shipyard is located along the Piscataqua River in Kittery, Maine (see Figure 1 in the application). The Shipyard occupies the whole of Seavey Island, encompassing 1.16 kilometers (km)² (278 acres) on what were originally five separate islands (Seavey, Pumpkin, Dennett's, Clarks, and Jamaica). Over the past 200 years, as a result of expansion from land-making activity, four of these islands (Seavey, Pumpkin, Dennett's, and Jamaica) were consolidated into one large island, which kept the name Seavey Island. Clarks Island is now attached to Seavey Island by a causeway. Seavey Island is

located in the lower Piscataqua River approximately 500 m (547 yards (yd)) from its southwest bank, 200 m (219 yd) from its north bank, and approximately 4.02 km (2.5 miles (mi)) from the mouth of the river.

Detailed Description of Activities

This IHA covers the Navy's planned in-water construction activities that will occur during the first year of construction, including completion of the king pile and concrete shutter panel bulkhead at Berth 11. Additional applications will be submitted for each subsequent year of in-water construction at Berths 11, 12, and 13 as well as for the replacement of the Dry Dock 3 caisson.

Pile Driving Operations

Piles of differing sizes will be utilized during construction activities including: 25-inch steel sheet piles driven by vibratory hammer; 14-inch steel H-type piles driven using impact hammer; 15-inch timber piles installed via vibratory hammer to reconstruct dolphins at the corner; and 36-inch steel H-type piles. Additionally, 14-inch steel H-type piles will be used to align and construct the trestle that will be extracted using vibratory hammer and 15-inch timber fender piles will be extracted using a vibratory hammer (see Table 1). The number of piles that can be driven per day varies for different project elements and is subject to change based on site conditions at the time. All activities covered under the issued IHA will occur at Berth 11.

At the beginning of the in-water work, existing timber piles will be removed from the berth faces and from the timber dolphin at the western end of the berth. The contractor will either construct a temporary construction trestle or place a jack-up barge alongside the berths to provide additional construction workspace. Pile driving and

extraction will also be needed to construct and disassemble the temporary construction trestle if the construction contractor selects this method over use of a jack-up barge, which will require no pile driving. The trestle system has been included in this analysis in order to model a conservative, worst-case scenario. If a jack-up barge is used instead of a trestle system, less pile driving will be needed, resulting in fewer marine mammal takes than predicted in this application.

For the proposed king pile and concrete shutter panel bulkhead (see Figures 2-1 and 2-2 in Application), the contractor will likely create templates and work in increments along the berth from the trestle or jack-up barge. For example, an approximately 50-foot-long template will allow installation of about 10 king piles and 20 sheet piles (along segments of the berths where sheet piles will be installed). The work will consist of setting a template (including temporary piles and horizontal members), which could take one or two days. Then the contractor will drill the rock sockets, which will take about one day per socket. One king pile per day will be driven and they will be regularly spaced along the berths and grouted into sockets.

The concrete shutter panels will then be installed in stacks between the king piles along most of the length of Berth 11. Installation of the concrete piles is not included in the noise analysis because no pile driving will be required. Along an approximately 4.8 m (16 ft) section at the eastern end of Berth 11A and an additional 30.8 m (101 ft) between Berths 11A and 11B, the depth to bedrock is greater, thus allowing a conventional sheet-pile bulkhead to be constructed. The steel sheet-piles will be driven to bedrock using a vibratory hammer. Sheet piles installed with a vibratory hammer also will be used to construct “returns,” which will be shorter bulkheads connecting the new bulkheads to the

existing bulkhead under the pier. Installation of the sheeting with a vibratory hammer is estimated to take less than one hour per pair of sheets. The contractor will probably install two sheets at a time and so the time required install the sheeting (10 pairs = 20 sheets) using vibratory hammers will only be about 8 hours per 10 pairs of sheets. Time requirements for all other pile types were estimated based on information compiled from ICF Jones and Strokes and Illingworth and Rodkin, Inc. (2012).

If sufficient construction funds are available, the Navy may install a king pile and concrete shutter panel bulkhead at Berth 11C as part of Phase 1. The bulkhead will extend from the western end of Berth 11B to the southern end of Berth 12. The in-water construction process will be the same as the process described above. Once the Berth 11 bulkheads are complete, the timber dolphins at the western end of the berth will be replaced with a single dolphin constructed of approximately seven piles.

The Navy will also install steel H-type sister piles at the location of the inboard portal crane rail beam at Berth 11, including Berth 11C. The sister piles will provide additional support for the portal crane rail system and restore its load-bearing capacity. The sister piles will be driven into the bedrock below the pier, in water generally less than 10 ft deep, using an impact hammer. The timing of this work depends on operational schedules at the berths. The sister piles may be installed either before or after the bulkheads are constructed.

Comments and Responses

A notice of NMFS' proposal to issue an IHA to the Navy was published in the *Federal Register* on August 9, 2016 (81 FR 52614). That notice described, in detail, the Navy's activity, the marine mammal species that may be affected by the activity, and the

anticipated effects on marine mammals. During the public comment period, NMFS received comments from the Marine Mammal Commission (Commission) which are listed below. The Commission ultimately recommended that NMFS issue the IHA, subject to inclusion of the proposed mitigation, monitoring, and reporting measures.

Comment #1: The Commission recommended that NMFS include its new thresholds for permanent threshold shift (PTS) and/or temporary threshold shift (TTS) in all relevant proposed incidental take authorizations rather than when the final authorization is issued.

Response: On August 4, 2016, NMFS published a *Federal Register* notice announcing the new Guidance. The notice of NMFS' proposal to issue an IHA to the Navy was published in the *Federal Register* on August 9, 2016 (81 FR 52614). However, the proposed IHA had been finalized and submitted for publication prior to the publication date of the Guidance. In the *Federal Register* notice, NMFS explained the approach it would take towards implementation of the new Guidance during a transition period. This approach was described previously in the *Summary of Request* section. As explained previously, NMFS fully considered the new Guidance in this IHA, which led to expanded Level A harassment zones, increased shut-down zones, and authorization of a small number of Level A harassment takes for a few species. These changes did not notably change our earlier analysis or findings. All new IHA requests will be evaluated using the thresholds established in the new Guidance.

Comment #2: The Commission recommended that NMFS (1) follow its policy of a 24-hour reset for enumerating the number of each species that could be taken during the proposed activities, (2) apply standard rounding rules before summing the numbers of

estimated takes across days, and (3) for species that have the potential to be taken but model-estimated or calculated takes round to zero, use group size to inform the take estimates—these methods should be used consistently for all future incidental take authorizations.

Response: Calculating predicted take is not an exact science, and there are arguments for taking different mathematical approaches in different situations and for making qualitative adjustments in other situations. NMFS is currently engaged in developing a protocol to guide more consistent take calculation given certain circumstances. However, the method for estimating take incidental to this action considered duration of activities, marine mammal group size, and previous monitoring reports.

Comment #3: The Commission recommended that NMFS require the Navy to implement full-time monitoring of Level A and B harassment zones during all pile-driving (including drilling rock sockets) and removal activities.

Response: NMFS shall require the Navy to monitor shutdown and Level A harassment zones during all impact pile driving activities. The Level B zone will be monitored during two-thirds of all pile-driving days. If a marine mammal is observed entering the Level B zone, a take will be recorded and behaviors documented. The Navy will extrapolate data collected during monitoring days and calculate total takes for all pile-driving days. NMFS is confident that this approach will provide an adequate representation of total takes.

Description of Marine Mammals in the Area of the Specified Activity

Five marine mammal species, including one cetacean and four pinnipeds, may inhabit or transit the waters near the Shipyard in the lower Piscataqua River during the specified activity. These include the harbor porpoise (*Phocoena phocoena*), gray seal (*Halichoerus grypus*), harbor seal (*Phoca vitulina*), hooded seal (*Crystphora cristata*), and harp seal (*Pagophilus groenlandicus*). None of the marine mammals that may be found in the Piscataqua River are listed under the Endangered Species Act (ESA). Table 2 lists the marine mammal species that could occur in the vicinity of the Shipyard and their estimated densities within the project area. As there are not specific density data for any of the species in the Piscataqua River, density data from the nearshore zone outside the mouth the Piscataqua River in the Atlantic Ocean have been used to calculate take.

Table 2. Marine Mammal Species Potentially Present in the Piscataqua River in the Vicinity of the Shipyard

Species	Stock Abundance ¹	Relative Occurrence in Piscataqua River	Season(s) of Occurrence	Approximate Density in the Vicinity of the Project Area (individuals per km ²) ³			
				Winter	Spring	Summer	Fall
Harbor Porpoise <i>Phocoena phocoena</i> Gulf of Maine/Bay of Fundy stock	79,883 (CV= 0.32)	Occasional use	Spring to Fall (April to December) ⁴	1.2122	1.1705	0.7903	0.9125
Gray Seal <i>Halichoerus grypus</i> Western North Atlantic stock	331,000 ²	Common	Year-round	0.2202	0.2202	0.2202	0.2202

Harbor Seal <i>Phoca vitulina</i> Western North Atlantic stock	75,834 (CV= 0.15)	Common	Year-round	0.1998	0.1998	0.1998	0.1998
Hooded Seal <i>Crystphora cristata</i> Western North Atlantic stock	592,100 ²	Rare	Winter to Spring (January – May)	N/A	N/A	N/A	N/A
Harp Seal <i>Pagophilus groenlandicus</i> Western North Atlantic stock	7,100,000	Rare	Winter to Spring (January – May)	0.0125	0.0125	0.0125	0.0125

Source: Waring *et al.*, 2015, except where noted.

Notes:

¹No population estimate is available for the U.S. western North Atlantic stock; therefore, the best population estimates are those for the Canadian populations as reported in Waring *et al.*, 2015.

²Source: Waring *et al.*, 2007. The population estimate for the Western North Atlantic hooded seal population was not updated in Waring *et al.*, 2015.

³Density data are taken from the Navy Marine Species Density Database (Crain 2015; Krause 2015).

⁴Densities shown for seasons when each species would not be likely to occur in the river

N/A = No data available

Key:

CV = coefficient of variation

km² = square kilometer

A detailed description of species likely to be affected by the Navy's project, including brief introductions to the species and relevant stocks, as well as available information regarding population trends and threats, and information regarding local occurrence, were provided in the *Federal Register* notice for the proposed IHA (81 FR 52614) and are not repeated here. Please refer to that *Federal Register* notice for these descriptions. Please also refer to NMFS' website (www.nmfs.noaa.gov/pr/species/mammals/) for generalized species accounts.

Potential Effects of the Specified Activity on Marine Mammals

The effects of underwater noise from pile driving, drilling, and extraction activities for the Navy's project have the potential to result in injury to and behavioral

harassment of marine mammals in the vicinity of the action area. The *Federal Register* notice for the proposed IHA (81 FR 52614) included a discussion of the potential behavioral effects of anthropogenic noise on marine mammals and, therefore, that information is not repeated here. Level A harassment, in the form of PTS may also occur.

Anticipated Effects on Marine Mammal Habitat

The main impact associated with the Navy's waterfront improvement project will be temporarily elevated sound levels and the associated direct effects on marine mammals. The project will not result in permanent impacts to habitats used directly by marine mammals, such as haulout sites, but may have potential short-term impacts to food sources such as forage fish and minor impacts to the immediate substrate during installation and removal of piles during the project. These potential effects are discussed in detail in the **Federal Register** notice for the proposed IHA (81 FR 52614). Therefore, that information is not repeated here.

Mitigation Measures

In order to issue an IHA under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, "and other means of effecting the least practicable impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking" for certain subsistence uses. NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other means of effecting the least

practicable adverse impact upon the affected species or stocks, their habitat (50 CFR 216.104(a)(11)). For this project, the Navy worked with NMFS to develop the following mitigation measures to minimize the potential impacts to marine mammals in the project vicinity. The primary purposes of these mitigation measures are to minimize sound levels from the activities, avoid unnecessary exposure to elevated sound levels, and to monitor marine mammals within designated zones of influence corresponding to NMFS' Level A and B harassment thresholds which are depicted in Tables 3 and 4 found later in the *Estimated Take by Incidental Harassment* section.

In addition to the measures described later in this section, the Navy will employ the following standard mitigation measures:

Time Restrictions – Pile driving/removal (vibratory as well as impact) will only be conducted during daylight hours so that marine mammals can be adequately monitored to determine if mitigation measures are to be implemented

Establishment of Shutdown zone - During pile driving and removal, shutdown zones shall be established to prevent injury to marine mammals as determined under the thresholds in NMFS' new Guidance. During all pile driving and removal activities, regardless of predicted sound pressure levels (SPLs), the entire shutdown zone will be monitored to prevent injury to marine mammals from their physical interaction with construction equipment during in-water activities. The shutdown zone during impact driving will extend to 75 m for all authorized species. The shutdown during vibratory driving will extend to 55 m for all authorized species. Pile driving and removal operations will cease if a marine mammal approaches the shutdown zone. Pile driving and removal operations will restart once the marine mammal is visibly seen leaving the

zone or after 15 minutes have passed with no pinnipeds sightings or 30 minutes with no cetacean sightings.

During all in-water construction other than pile-driving (*e.g.*, using standard barges, tug boats), if a marine mammal comes within 10 m, operations shall cease and vessels shall reduce speed to the minimum level required to maintain steerage and safe working conditions.

Establishment of Level A Harassment Zone – The Level A harassment zone is an area where animals may be exposed to sound levels that could result in PTS injury. The primary purpose of the Level A zone is monitoring for documenting incidents of Level A harassment. The Level A zones will extend from the 75 m shutdown zone out to 340 m for harbor porpoises and out to 155 m for gray and harbor seals during all impact driving activities. Determination of Level A zones is described later in the section *Estimated Take by Harassment*. The Level A injury zone will be monitored during all impact driving activities. Animals observed in the Level A harassment zone will be recorded as Level A takes.

Establishment of Level B Zone – The Level B zones are areas in which SPLs equal or exceed 160 decibal root mean square (dB rms) for impact driving and 120 dB rms for vibratory driving but are less than the Level A zone. The shutdown zone during all vibratory driving is 55 m. The primary purpose of the Level B zone is monitoring for documenting incidents of Level B harassment. Monitoring of the Level B zone is discussed in greater detail later (see “Monitoring and Reporting”). The entire Level B zone will be monitored during two-thirds of all pile driving days. If a marine mammal is observed entering the Level B zone, a take will be recorded and behaviors documented.

The Navy will extrapolate data collected during monitoring days and calculate total takes for all pile driving days.

All shutdown and disturbance zones will initially be based on the distances from the source that were predicted for each threshold level. However, threshold distances may be changed as necessary depending on results from the required hydroacoustic monitoring. This may require a modification to the issued IHA.

Soft Start – The use of a soft start procedure is believed to provide additional protection to marine mammals by providing a warning and/or giving marine mammals a chance to leave the area prior to the hammer operating at full capacity. The Navy will use soft-start techniques recommended by NMFS for impact driving. Soft start must be conducted at beginning of day's activity and at any time pile driving has ceased for more than 30 minutes. For impact hammer driving, contractors are required to provide an initial set of three strikes from the impact hammer at 40 percent energy, followed by a 30-second waiting period, then two subsequent 3-strike sets. The 30-second waiting period is proposed based on the Navy's recent experience and consultation with NMFS on a similar project at Naval Base Kitsap at Bangor (Department of the Navy 2010).

Mitigation Conclusions

NMFS has established various mitigation measures and considered a range of other measures in the context of ensuring that NMFS prescribes the means of effecting the least practicable impact on the affected marine mammal species and stocks and their habitat. We included measures in the IHA which consider the following factors in relation to one another:

- The manner in which, and the degree to which, the successful implementation of the measure is expected to minimize adverse impacts to marine mammals;
- The proven or likely efficacy of the specific measure to minimize adverse impacts as planned; and
- The practicability of the measure for applicant implementation.

Based on our evaluation of the applicant's measures, as well as other measures considered by NMFS, our determination is that the mitigation measures provide the means of effecting the least practicable impact on marine mammals species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Monitoring and Reporting

In order to issue an ITA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth, "requirements pertaining to the monitoring and reporting of such taking." The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for ITAs must include the suggested means of accomplishing the necessary monitoring and reporting that would result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the proposed action area.

Monitoring measures prescribed by NMFS should accomplish one or more of the following general goals:

1. An increase in the probability of detecting marine mammals, both within the mitigation zone (thus allowing for more effective implementation of

the mitigation) and in general to generate more data to contribute to the analyses mentioned below;

2. An increase in our understanding of how many marine mammals are likely to be exposed to levels of pile driving that we associate with specific adverse effects, such as behavioral harassment, TTS, or PTS;
3. An increase in our understanding of how marine mammals respond to stimuli expected to result in take and how anticipated adverse effects on individuals (in different ways and to varying degrees) may impact the population, species, or stock (specifically through effects on annual rates of recruitment or survival) through any of the following methods:
 - Behavioral observations in the presence of stimuli compared to observations in the absence of stimuli (need to be able to accurately predict received level, distance from source, and other pertinent information);
 - Physiological measurements in the presence of stimuli compared to observations in the absence of stimuli (need to be able to accurately predict received level, distance from source, and other pertinent information);
 - Distribution and/or abundance comparisons in times or areas with concentrated stimuli versus times or areas without stimuli;
4. An increased knowledge of the affected species; and
5. An increase in our understanding of the effectiveness of certain mitigation and monitoring measures.

Acoustic Monitoring

The Navy will implement in situ acoustic monitoring efforts to measure SPLs from in-water construction activities. The Navy will collect and evaluate sound level measurements for 10 percent of the pile-driving activities conducted, sufficient to confirm measured contours associated with the acoustic zones of influence (ZOI). The Navy will conduct acoustic monitoring at the source (33 feet) and, where the potential for Level A harassment exists (out to 340 meters for harbor porpoises and out to 155 m for gray and harbor seals for impact pile driving), at a second representative monitoring location at an intermediate distance between the cetacean and pinniped shutdown zones (75 m for impact, 55 m for vibratory). In conjunction with measurements of SPLs, shutdown monitoring locations, Level A monitoring locations there will also be intermittent verification for impact driving or pile driving and extraction to determine the actual distances to the Level B 160 dB re rms (impact) and 120 re rms (vibratory) isopleths. Acoustic measurements will continue during subsequent years of in-water construction for the Project. The Navy shall initiate acoustic monitoring and submit preliminary findings to NMFS within 45 days of commencement of pile driving activities.

Visual Marine Mammal Observations

The Navy will collect sighting data and behavioral responses to construction for marine mammal species observed in the region of activity during the period of construction. Monitoring will be conducted by qualified observers, who will be placed at the best vantage point(s) practicable to monitor for marine mammals and implement shutdown/delay procedures when applicable by calling for the shutdown to the hammer

operator. NMFS requires that the observers have no other construction-related tasks while conducting monitoring. Qualified observers are trained biologists, with the following minimum qualifications:

- Visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the water's surface with ability to estimate target size and distance; use of binoculars may be necessary to correctly identify the target;
- Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;
- Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates and times when in-water construction activities were suspended to avoid potential incidental injury from construction sound of marine mammals observed within a defined shutdown zone; and marine mammal behavior; and
- Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

The Navy will monitor the shutdown zone and Level A zone before, during, and after pile driving activities. The Level B zone will be monitored during two-thirds of pile

driving. Based on NMFS requirements, the Marine Mammal Monitoring Plan shall include the following procedures:

- A minimum of two marine mammal observers (MMOs) will be in place during all pile-driving operations. MMOs designated by the contractor will be placed at the best vantage point(s) practicable to monitor for marine mammals and implement shutdown/delay procedures when applicable by calling for the shutdown to equipment operators. The MMOs shall be separated and spread out, looking in opposite directions across the ZOIs;
- The individuals shall scan the waters within each monitoring zone activity using big-eye binoculars (25x or equivalent), hand held binoculars (7x) and visual observation;
- Monitoring distances will be measured with range finders;
- Bearing to animals will be determined using a compass;
- The MMOs shall have no other construction-related tasks while conducting monitoring and will be trained on the observation zones, species identification, how to observe, and how to fill out the data sheets by the Navy Natural Resources Manager prior to any pile driving activities;
- The Navy shall conduct briefings between construction supervisors and crews, marine mammal monitoring team, acoustical monitoring team prior to the start of all pile driving activities, and when new personnel join the work, in order to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures. All personnel working in the project area will watch the Navy's Marine Species Awareness Training video. An informal

guide will be included with the monitoring plan to aid in identifying species if they are observed in the vicinity of the Project area;

- Monitoring shall take place from 15 minutes prior to initiation of pile driving activity through 30 minutes post-completion of pile driving activity. Pre-activity monitoring shall be conducted for 15 minutes to ensure that the shutdown zone is clear of marine mammals, and pile driving may commence when observers have declared the shutdown zone clear of marine mammals;
- Pile driving shall only take place when the entire shutdown and Level A zones are visible and can be adequately monitored. If conditions (*e.g.*, fog) prevent the visual detection of marine mammals, activities with the potential to result in Level A harassment will not be initiated. If such conditions arise after the activity has begun, impact pile driving will be curtailed, but vibratory pile driving or extraction will be allowed to continue;
- If a marine mammal approaches or enters the shutdown zone, all pile driving activities at that location shall be halted. If pile driving is halted or delayed at a specific location due to the presence of a marine mammal, the activity may not commence or resume until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone or 15 minutes have passed without re-detection of the animal; and
- Shutdown will occur if a species for which authorization has not been granted or for which the authorized numbers of takes have been met approaches or is observed within the Level B harassment zone. The Navy will then contact NMFS immediately.

Data Collection

MMOs will use NMFS' approved data forms. Among other pieces of information, the Navy will record detailed information about any implementation of shutdowns, including the distance of animals to the pile and description of specific actions that ensued and resulting behavior of the animal, if any. At a minimum, the following information will be collected on the sighting forms:

- Date and time that monitored activity begins or ends;
- Construction activities occurring during each observation period;
- Weather parameters (*e.g.*, percent cover, visibility);
- Water conditions (*e.g.*, sea state, tide state);
- Species, numbers, and, if possible, sex and age class of marine mammals;
- Description of any observable marine mammal behavior patterns, including bearing and direction of travel and distance from pile driving activity;
- Distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;
- Locations of all marine mammal observations; and
- Other human activity in the area.

Reporting Measures

The Navy will provide NMFS with a draft monitoring report within 90 days after completion of pile driving activities or 60 days prior to any subsequent authorization, whichever is sooner. A monitoring report is required before another authorization can be

issued to the Navy. This report will detail the monitoring protocol, summarize the acoustic and marine mammal data recorded during monitoring, and estimate the number of marine mammals that may have been harassed. If no comments are received from NMFS within 30 days, the draft final report will constitute the final report. If comments are received, a final report must be submitted within 30 days after receipt of comments. The report will include data and information listed in Section 13.3 of the application.

In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner not authorized by the IHA (*e.g.*, equipment interaction, ship-strike) the Navy shall immediately cease the specified activities and report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the Northeast/Greater Atlantic Regional Stranding Coordinator. The report will include the following information:

- Time, date, and location (latitude/longitude) of the incident;
- Description of the incident;
- Status of all sound source use in the 24 hours preceding the incident;
- Water depth;
- Environmental conditions (*e.g.*, wind speed and direction, Beaufort sea state, cloud cover, and visibility);
- Description of all marine mammal observations in the 24 hours preceding the incident;
- Species identification or description of the animal(s) involved;
- Fate of the animal(s); and
- Photographs or video footage of the animal(s) (if equipment is available).

Activities will not resume until NMFS is able to review the circumstances of the prohibited take. NMFS will work with the Navy to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. The Navy will not be able to resume their activities until notified by NMFS via letter, email, or telephone.

In the event that the Navy discovers an injured or dead marine mammal, and the lead MMO determines that the cause of the injury or death is unknown and the death is relatively recent (*i.e.*, in less than a moderate state of decomposition as described in the next paragraph), the Navy will immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the Northeast/ Greater Atlantic Regional Stranding Coordinator. The report will include the same information identified in the paragraph above. Activities will be able to continue while NMFS reviews the circumstances of the incident. NMFS will work with the Navy to determine whether modifications in the activities are appropriate.

In the event that the Navy discovers an injured or dead marine mammal, and the lead MMO determines that the injury or death is not associated with or related to the activities authorized in the IHA (*e.g.*, previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), the Navy will report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, and the Northeast/ Greater Atlantic Regional Stranding Coordinator within 24 hours of the discovery. The Navy will provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS and the Marine Mammal Stranding Network.

Estimated Take by Incidental Harassment

Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines “harassment” as: “any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).”

All anticipated takes will be from impact and vibratory pile driving and involve PTS (Level A) and temporary changes in behavior (Level B). The proposed notice of authorization (81 FR 52614) describes Level A and Level B impacts, including PTS. Low level responses to sound (*e.g.*, short-term avoidance of an area, short-term changes in locomotion or vocalization) are less likely to result in fitness effects on individuals that will ultimately affect the stock or the species as a whole. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on individual animals could potentially be significant and could potentially translate to effects on annual rates of recruitment or survival (*e.g.*, Lusseau and Bejder, 2007; Weilgart, 2007).

Specific understanding of the activity and the effected species are necessary to predict the severity of impacts and the likelihood of fitness impacts. However, we start with the estimated number of takes, understanding that additional analysis is needed to understand what those takes mean. Given the many uncertainties in predicting the quantity and types of impacts of sound on marine mammals, it is common practice to estimate how many animals are likely to be present within a particular distance of a given

activity, or exposed to a particular level of sound, taking the duration of the activity into consideration. This practice provides a good sense of the number of instances of take, but potentially overestimates the numbers of individual marine mammals taken. In particular, for stationary activities, it is more likely that some smaller number of individuals may accrue a number of incidences of harassment per individual than for each incidence to accrue to a new individual, especially if those individuals display some degree of residency or site fidelity and the impetus to use the site (*e.g.*, because of foraging opportunities) is stronger than the deterrence presented by the harassing activity.

The Navy has requested authorization for the incidental taking of small numbers of harbor porpoises, harbor seals, gray seals, hooded seals and harp seals near the Shipyard that may result from pile driving during construction activities associated with waterfront improvement project. We described applicable sound thresholds for determining Level B effects to marine mammals before describing the information used in estimating the sound fields; the available marine mammal density or abundance information; and the method of estimating potential incidents of take in detail in our *Federal Register* notice of proposed authorization (81 FR 52614). Information on applicable sound thresholds for determining Level A auditory injury harassment may be found in the new Guidance document (81 FR 51694; August 4, 2016). NMFS' calculation of the Level A harassment zones utilized the methods presented in Appendix D of the new Guidance and the accompanying Optional User Spreadsheet. The spreadsheet accounts for a marine mammal hearing group's potential susceptibility to noise-induced hearing loss at different frequencies (*i.e.*, auditory weighting functions) using Weighting Factor Adjustments (WFAs). NMFS' new acoustic thresholds use dual

metrics of cumulative sound exposure level and peak sound level for impulsive sounds (e.g., impact pile driving) and cumulative sound exposure level for non-impulsive sounds (e.g., vibratory pile driving). NMFS used source level measurements from similar pile driving events coupled with practical spreading loss ($15 \log R$), and applied the updated PTS onset thresholds for impulsive peak sound pressure and cumulative sound exposure level (SEL_{cum}) metric using the Optional User spreadsheet derived from the new acoustic guidance to determine distance to the isopleth for PTS onset for impact pile driving. In the case of the dual metric acoustic thresholds for impulsive sound, the larger of the two isopleths for calculating PTS onset is used. Similarly, for vibratory pile driving, NMFS used the Optional User Spreadsheet to determine isopleth estimates for PTS onset using the SEL_{cum} metric (<http://www.nmfs.noaa.gov/pr/acoustics/guidelines.htm>). In determining the cumulative sound exposure levels, the Guidance considers the duration of the activity within a 24-h period, and the associated adjustment from the WFAs by hearing group. All calculated distances to marine mammal sound thresholds are provided in Tables 3 and 4. These values were then used to develop mitigation measures for proposed pile driving activities.

The new Guidance indicates that there is a greater likelihood of auditory injury for phocid pinnipeds (i.e., seals) and for high-frequency cetaceans (i.e., harbor porpoise) than was considered in our *Federal Register* notice of proposed authorization. In order to address this increased likelihood, we increased the shutdown zones required from 10 m to 75 m during impact driving and 10 m to 55 m during vibratory driving. In addition, to account for the potential that animals may occur in the Level A harassment zones, we

authorize the taking by Level A harassment of 10 harbor porpoises, 4 harbor seals and 2 gray seals.

Table 3. Level A Harassment Isopleths from Impact and Vibratory Pile Driving

Functional Hearing Group		High-Frequency Cetaceans (harbor porpoises)	Phocid Pinnipeds (seals)
Impact Pile Driving	PTS SEL _{cum} * threshold (dB)	155	185
	PTS Isopleth to threshold (meters)	340 (336 rounded)	155 (151 rounded)
Vibratory Pile Driving	PTS SEL _{cum} * threshold (dB)	173	201
	PTS Isopleth to threshold (meters)	55	23

*Cumulative Sound Exposure Level

Table 4. Level B Harassment Isopleths from Impact and Vibratory Pile Driving

Drilling Activity	Behavioral Thresholds for Cetaceans and Pinnipeds	Propagation Model	Attenuation Distance to Threshold
Impact Hammer	160 dB RMS	Cylindrical Spreading Loss (<3 m water depth)	1.58 km (0.984 mi)
Vibratory Hammer	120 dB RMS	Practical Spreading Loss (3 m to 15 m water depth)	7.35 km (4.57 mi)

Note: All source levels are referenced to 1 microPascal (re 1 µPa)

No sound is expected to fully attenuate to the 120 dB rms threshold for vibratory pile driving because topographic features (*e.g.* islands, shorelines) in the river will prevent attenuation to the full distance of 7.35 km. No sound will reach the 160 dB rms threshold at the full distance of 1.58 km for the impact hammer due to these same sound-blocking topographical features.

Animals do occasionally haul-out on rocks/jetties and could be flushed into the water. However, it is assumed that any hauled out animals within the disturbance zone will also enter the water and be exposed to underwater noise. Therefore, to avoid possible double-counting, acoustic disturbance to pinnipeds resulting from airborne sounds from pile driving was not considered.

Description of Take Calculation

The take calculations presented here relied on the best data currently available for marine mammal populations within close proximity to the Piscataqua River. There are not population data for any marine mammal species specifically within the Piscataqua River, therefore, the population data used are from the most recent NMFS Stock Assessment Reports (SAR) for the Atlantic Ocean. The most recent SAR population number was used for each species. The specific SAR used is discussed within each species take calculation in Sections 6.6.1 through 6.6.5 of the application. The formula was developed for calculating take due to pile driving, extraction, and drilling and applied to the species-specific noise-impact threshold. The formula is founded on the following assumptions:

- All piles to be installed will have a noise disturbance distance equal to the pile that causes the greatest noise disturbance;
- Pile driving could potentially occur every day of the in-water work window; however, it is estimated no more than a few hours of pile driving will occur per day; and

- An individual can only be taken once per day due to sound from pile driving, whether from impact or vibratory pile driving.

The conservative assumption is made that all pinnipeds within the ZOI will be underwater during at least a portion of the noise generating activity and, hence, exposed to sound at the predicted levels.

The calculation for marine mammal takes is estimated by the following unless stated otherwise:

Take estimate = $(n * ZOI) * X$ days of total activity

where:

n = density estimate used for each species

X = number of days of pile driving, estimated based on the total number of piles and the average number of piles that the contractor can install per day.

ZOI = noise threshold zone of influence (ZOI) impact area

The calculation $n * ZOI$ produces an estimate of the abundance of animals that could be present in the area of exposure per day. The abundance is then multiplied by the total number of days of pile driving to determine the take estimate. Because the estimate must be a whole number, this value was rounded up.

The ZOI impact area is the estimated range of impact on marine mammals during in-water construction. The ZOI is the area in which in-water sound will exceed designated NMFS thresholds. The formula for determining the area of a circle ($\pi * radius^2$) was used to calculate the ZOI around each pile, for each threshold. The distances specified were used for the radius in the equation. The ZOI impact area does not encompass landforms that may occur within the circle. The ZOI also took into

consideration the possible affected area of the Piscataqua River from the furthest pile driving/extraction site with attenuation due to land shadowing from islands in the river as well as the river shoreline.

Harbor Porpoise

Harbor porpoises may be present in the project area during spring, summer, and fall, from April to December. Based on density data from the Navy Marine Species Density Database (NMSDD), their presence is highest in spring, decreases in summer, and slightly increases in fall. Average density for the predicted seasons of occurrence was used to determine abundance of animals that could be present in the area for exposure, using the equation $\text{abundance} = n * \text{ZOI}$. Estimated abundance for harbor porpoises was 0.96 animals per day generated from the equation ($0.9445 \text{ km}^2 \text{ Level B zone} * 1.02 \text{ animals/km}^2$). Therefore, the number of Level B harbor porpoise exposures within the ZOIs is ($156 \text{ days} * 0.96 \text{ animals/day}$) resulting in up to 150 Level B takes of harbor porpoises.

To estimate potential take from beyond the 75 m shutdown zone out to 340 m (isopleth for full Level A injury zone), the density of harbor porpoises in the area of the full Level A injury zone (0.354673 km^2) was estimated at $1.02 \text{ harbor porpoises/km}^2$. The area of the 75 meter shutdown zone, 0.01767 km^2 was subtracted from the full Level A injury zone to obtain the area of the Level A take zone (0.337003 km^2 .) Using the density of harbor porpoises potentially present (1.02 animal/km^2) and the area of the Level A take zone (0.337003 km^2), less than one (0.3437) harbor porpoise was estimated to be exposed to injury a day over the 13 days of impact pile driving. While the calculated take for harbor porpoises is 4.47 animals ($0.3437 \text{ harbor porpoise/day} * 13 \text{ days}$), NMFS

conservatively authorizes 10 takes of harbor porpoises that could be exposed to injurious noise levels during impact pile driving.

Gray Seal

Gray seals may be present year-round in the project vicinity, with constant densities throughout the year. Gray seals are less common in the Piscataqua River than the harbor seal.

As with gray seals, NMFS originally used density data from NMSDD to calculate exposures for the proposed *Federal Register* notice. As noted previously, the NMSDD data pertains to offshore waters. Local information regarding the density and abundance of harbor seals is not available in the immediate vicinity of the shipyard, but seals are likely to be attracted to nearby haulout locations. Therefore, it is likely that gray seal densities may be greater than those listed in NMSDD. Given this information, NMFS estimates that one gray seal may be taken, by Level B harassment, per day resulting in a final authorized take of 156 gray seals.

To estimate potential take from past the 75 m shutdown zone to 155 m (isopleth for full Level A injury zone), the density of gray seals as provided by the NMSDD in the area of the full Level A injury zone (0.0716314 km^2) was estimated at 0.2202 grey seals/ km^2 . The area of the 75 meter shutdown zone, 0.01767 km^2 , was subtracted from the full Level A injury zone to obtain an area of 0.0539 km^2 . Using the density of gray seals potentially present ($0.2202 \text{ animal/km}^2$) and the area of the Level A take zone (0.0539 km^2), less than one gray seal was estimated to be exposed to injury a day ($0.0118 \text{ animals/day}$) with less than one injury exposure (0.1545 animals) during 13 days of impact driving. However, given that the NMSDD may underrepresent local density

information NMFS will conservatively authorize the Level A take of two gray seals for the life of the IHA.

Harbor Seal

Harbor seals may be present year-round in the project vicinity, with constant densities throughout the year. Harbor seals are the most common pinniped in the Piscataqua River near the Shipyard. In the proposed **Federal Register** notice NMFS used density data from NMSDD to calculate exposures. However, the NMSDD provides density data pertaining to offshore waters and is not generally intended to be applied to inshore locations. Local information regarding density and abundance of gray seals is not available in the immediate vicinity of the shipyard. Therefore, it is likely that local densities may be far greater than those listed in NMSDD. They are also likely to occur more frequently than gray seals. Given this information, NMFS authorizes the take, by Level B harassment of two harbor seals per day resulting in a total of 312 harbor seals.

To estimate potential take from past the 75 m shutdown zone to 155 m (isopleth for full Level A injury zone), the density of harbor seals in the area of the full Level A injury zone (0.0716314 km^2) was estimated at $0.1998 \text{ harbor seals/km}^2$. The area of the 75 m shutdown zone (0.01767 km^2) was subtracted from the full Level A injury zones to obtain a Level A take zone area of 0.0539 km^2 . Using the density of harbor seal potentially present ($0.1998 \text{ animal/km}^2$) and the area of the Level A take zone (0.0539 km^2), less than one harbor seal was estimated to be exposed to injury per day (0.0107 seals/day) during the 13 days of impact driving resulting in a total calculated take of 0.1401 seals. However, since the NMSDD likely underrepresents density and NMFS assumed that harbor seals are more likely to occur in the project area compared to gray

seals, NMFS authorizes the Level A take of four harbor seals, which is twice the amount authorized for gray seals.

Harp Seal

Harp seals may be present in the Project vicinity during the winter and spring, from January through February. In general, harp seals are observed far less frequently than the harbor seal and gray seal in the Piscataqua River. These animals are conservatively assumed to be present within the underwater Level B harassment zone during each day of in-water pile driving. Average density for the predicted seasons of occurrence was used to determine abundance of animals that could be present in the area for exposure, using the equation $\text{abundance} = n * \text{ZOI}$. Abundance for harp seals was 0.0118/day ($0.9945 \text{ km}^2 * 0.0125 \text{ animals/km}^2$). Therefore, the number of Level B harp seal takes within the ZOI is (156 days * 0.0118 animals/day) resulting in up to 2 level B exposures of harp seals within the ZOI. NMFS is, however, conservatively authorizing a total of 5 harp seal Level B takes and zero Level A takes.

Hooded Seal

Hooded seals may be present in the project vicinity during the winter and spring, from January through May, though their exact seasonal densities are unknown. In general, hooded seals are much rarer than the harbor seal and gray seal in the Piscataqua River. Anecdotal sighting information indicates that two hooded seals were observed from the Shipyard in August 2009, but no other observations have been recorded (Trefry, November 20, 2015). Information on the average density for hooded seals was not available. Given the low likelihood of occurrence NMFS is conservatively authorizing a total of 5 hooded seal Level B takes and no Level A takes.

The total number of takes authorized for the five marine mammal species that may occur within the Navy’s project area during the duration of in-water construction activities are presented in Table 5.

Table 5. Authorized Level A and Level B Harassment Takes Over 156 Days

Species	Level B Takes	Level A Takes
Harbor Porpoise	150	10
Gray Seal	156	2
Harbor Seal	312	4
Harp Seal	5	0
Hooded Seal	5	0

Analysis and Determinations

Negligible Impact

Negligible impact is “an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival” (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of Level B harassment takes, alone, is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be “taken” through behavioral harassment, NMFS must consider other factors, such as the likely nature of any responses (their intensity, duration, etc.), the context of any responses (critical reproductive time or location, migration, etc.), as well as the

number and nature of estimated Level A and Level B harassment takes, the number of estimated mortalities, effects on habitat, and the status of the species.

To avoid repetition, the discussion of our analyses applies to all the species listed in Table 2. There is little information about the nature of severity of the impacts or the size, status, or structure of any affected species or stock that would lead to a different analysis for this activity. Pile driving and pile extraction activities associated with the Navy project as outlined previously have the potential to injure, disturb or displace marine mammals. Specifically, the specified activities may result in Level B harassment (behavioral disturbance) for all species authorized for take, from underwater sound generated from pile driving. Level A injury may also occur to limited numbers of three marine mammal species. Takes could occur if individuals of these species are present in the Level A and Level B ensonified zones when pile driving activities are under way.

Any takes from Level A harassment will potentially be in the form of PTS and may affect small numbers of harbor porpoise, harbor seal, and gray seal. As described previously, because of the proximity to the source in which the animals would have to approach, or the longer time in which they would need to stay in a farther proximity to the source (four hours at the outer perimeter of Level A zone), we believe this unlikely, but have acknowledged it could occur - however, any PTS incurred as a result of this activity would not be expected to be of a severe degree. That would necessitate even more time in the vicinity of the source, which is considered unlikely given required mitigation and general anticipated behaviors of avoidance around loud sounds.

Furthermore, death is unlikely for all authorized species as the Navy will enact required monitoring and mitigation measures and sound levels generated from the specified

activities are not anticipated to cause mortality. The Navy will monitor shutdown and Level A zones during all pile driving activities, which will limit potential injury to these species. The Navy will also record all occurrences of marine mammals in specified Level A zones. In this analysis, we considered the potential for limited numbers of harbor porpoise, harbor seal and gray seal to incur auditory injury and found that it would not change our previous determinations.

Any takes from Level B harassment will be due to behavioral disturbance. The potential for these outcomes is greatly reduced through the implementation of the following planned mitigation measures. The Navy will employ a “soft start” when initiating impact driving activities. Given sufficient “notice” through use of soft start, marine mammals are expected to move away from a pile driving source. The Navy will monitor shutdown and disturbance zones where the likelihood of marine mammal detection by trained observers is high under the environmental conditions described for waters around the project area. Shutdowns will occur if animals come within 10 meters of operational activities other than pile driving to avoid injury, serious injury, or mortality. Furthermore, the Navy’s proposed activities are highly localized impacting a small portion of the Piscataqua River which is only a subset of the ranges of species for which take is authorized.

The project also is not expected to have significant adverse effects on marine mammal habitat, as analyzed in detail in the “Anticipated Effects on Marine Mammal Habitat” section in the proposed **Federal Register** notice (81 FR 52614). No important feeding and/or reproductive areas for marine mammals are known to be near the project area. Project-related activities may cause some fish to leave the area of disturbance, thus

temporarily impacting marine mammals' foraging opportunities in a limited portion of the foraging range; but, because of the relatively small area of the habitat range utilized by each species that may be affected, the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences.

Exposures to elevated sound levels produced during pile driving activities may cause brief startle reactions or short-term behavioral modification by the animals. Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from other similar activities, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring) (*e.g.*, Thorson and Reyff, 2006; Lerma, 2014). Most likely, individuals will simply move away from the sound source and be temporarily displaced from the areas of pile driving, although even this reaction has been observed primarily only in association with impact pile driving. These reactions and behavioral changes are expected to subside quickly when the exposures cease. The pile driving activities analyzed here are similar to, or less impactful than, numerous construction activities conducted in other similar locations, which have taken place with no reported injuries or mortality to marine mammals, and no known long-term adverse consequences from behavioral harassment. Repeated exposures of individuals to levels of sound that may cause Level B harassment here are unlikely to result in permanent hearing impairment or to significantly disrupt foraging behavior. Thus, even repeated Level B harassment of some small subset of the species is unlikely to result in any realized decrease in fitness for the affected individuals, and thus will not result in any adverse impact to the stock as a whole. Level B harassment will be reduced to the level of least

practicable impact through use of mitigation measures described herein. Finally, if sound produced by project activities is sufficiently disturbing, animals are likely to simply avoid the project area while the activity is occurring.

In summary, the negligible impact analysis is based on the following: (1) The possibility of mortality is reasonably considered discountable; (2) the area of potential impacts is highly localized; (3) anticipated incidents of Level B harassment consist of temporary modifications in behavior; (4) anticipated incidences of Level A harassment would be in the form of a small degree of PTS to limited numbers of three species; (5) the absence of any significant habitat within the project area, including rookeries, or known areas or features of special significance for foraging or reproduction; and (6) the anticipated efficacy of the required mitigation measures in reducing the effects of the specified activity. In combination, we believe that these factors, as well as the available body of evidence from other similar activities, demonstrate that the potential effects of the specified activity will have only short-term effects on individuals. The specified activity is not expected to impact rates of recruitment or survival of marine mammal species or stocks. Therefore, based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the proposed monitoring and mitigation measures, NMFS finds that the total marine mammal take from the Navy's proposed waterfront improvement project will have a negligible impact on the affected marine mammal species or stocks.

Small Numbers

Table 6 illustrates the numbers of animals that could be exposed to Level A and Level B harassment thresholds from work associated with the waterfront improvement project. The analyses provided represents that the numbers of authorized Level A and Level B takes account for <0.01% of the populations of these stocks that could be affected. These are small numbers of marine mammals relative to the sizes of the affected species and population stocks under consideration.

Table 6. Estimated Number of Exposures and Percentage of Stocks That May Be Subject to Level A and Level B Harassment

Species	Authorized Takes	Stock(s) Abundance Estimate	Percentage of Total Stock
Harbor Porpoise Gulf of Maine/Bay of Fundy stock	150 Level B 10 Level A	79,883	<0.01%
Gray Seal Western North Atlantic stock	156 Level B 2 Level A	331,000	<0.01%
Harbor Seal Western North Atlantic stock	312 Level B 4 Level A	75,834	<0.01%
Harp Seal Western North Atlantic stock	5	7,100,000	<0.01%
Hooded Seal	5	592,100	<0.01%

Based on the methods used to estimate take, and taking into consideration the implementation of the mitigation and monitoring measures, we find that small numbers

of marine mammals will be taken relative to the populations of the affected species or stocks.

Impact on Availability of Affected Species for Taking for Subsistence Uses

There are no relevant subsistence uses of marine mammals implicated by this action. Therefore, NMFS has determined that the total taking of affected species or stocks will not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Endangered Species Act (ESA)

No species listed under the ESA are expected to be affected by these activities and none are authorized to be taken in the IHA. Therefore, NMFS determined that issuance of the IHA has no effect on ESA-listed species and section 7 consultation under the ESA was not required to issue the IHA.

National Environmental Policy Act (NEPA)

In compliance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*), as implemented by the regulations published by the Council on Environmental Quality (40 CFR parts 1500-1508), the Navy prepared an Environmental Assessment (EA) to consider the direct, indirect and cumulative effects to the human environment resulting from the waterfront improvement project. NMFS made the Navy's EA available to the public for review and comment, concurrently with the publication of the proposed IHA, on the NMFS web site (at www.nmfs.noaa.gov/pr/permits/incidental/), in relation to its suitability for adoption by NMFS in order to assess the impacts to the human environment of issuance of an IHA to the Navy. In compliance with NEPA and the CEQ regulations, as well as NOAA Administrative Order 216-6, NMFS has reviewed

the Navy's EA, determined it to be sufficient, adopted that EA and signed a Finding of No Significant Impact (FONSI) on November 8, 2016.

Authorization

As a result of these determinations, NMFS has issued an IHA to the Navy for a waterfront improvement project at the Portsmouth Naval Shipyard in Kittery, Maine, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated.

Dated: November 18, 2016.

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